

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference PC541ED ✓	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/IB2004/004253 ✓	International filing date (day/month/year) 22/12/2004 ✓	(Earliest) Priority Date (day/month/year) 22/12/2003 ✓
Applicant INFN ISTITUTO NAZIONALE PER LA FISICA DELLA ... ✓		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 ✓ sheets.

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It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐

The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☐ **Unity of invention is lacking** (see Box III).

4. With regard to the **title**,

☒

the text is approved as submitted by the applicant. ✓

☐

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒

the text is approved as submitted by the applicant. ✓

☐

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1, 2 ✓

☒

as suggested by the applicant.

☐

as selected by this Authority, because the applicant failed to suggest a figure.

☐

as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB2004/004253

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01N21/33 G01N21/31 H01L31/0264 H01L31/0352

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 796 590 A (DEGOBERT ET AL) 10 January 1989 (1989-01-10) column 2, line 49 - line 62 column 3, line 15 - line 64 figure 1	1-22
Y	MORKOC H: "Potential applications of III-V nitride semiconductors" MATERIALS SCIENCE AND ENGINEERING B, ELSEVIER SEQUOIA, LAUSANNE, CH, vol. 43, no. 1-3, 1997, pages 137-146, XP004073412 ISSN: 0921-5107 abstract	1-22



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

27 April 2005

Date of mailing of the international search report

04/05/2005

Name and mailing address of the ISA

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Stussi, E

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	MORKOC H ET AL: "GaN-based modulation doped FETs and UV detectors" SOLID STATE ELECTRONICS, ELSEVIER SCIENCE PUBLISHERS, BARKING, GB, vol. 46, no. 2, February 2002 (2002-02), pages 157-202, XP004330888 ISSN: 0038-1101 . 159, col.1, paragraph 2, 11.1-4 and col. 2, paragraph 2, 1.3 -----	1-22
Y	POTI' ET AL: "High responsivity GaN-based UV detectors" ELECTRONICS LETTERS, IEE STEVENAGE, GB, vol. 39, no. 24, 27 November 2003 (2003-11-27), pages 1747-1749, XP006024489 ISSN: 0013-5194 p.1747, col.1, "Introduction", paragraph 1 -----	1-22
Y	HENINI M: "III-V nitrides for electronic and UV applications" III VS REVIEW, ELSEVIER SCIENCE PUBLISHERS, OXFORD, GB, vol. 12, no. 5, September 1999 (1999-09), pages 28,30-32, XP004189082 ISSN: 0961-1290 Abstract and p.28, col.3, paragraph 2; p.30, col.1, paragraph 1 -----	1-22
Y	STRITE S ET AL: "PROGRESS AND PROSPECTS FOR GAN AND THE III-V NITRIDE SEMICONDUCTORS" THIN SOLID FILMS, ELSEVIER-SEQUOIA S.A. LAUSANNE, CH, vol. 231, no. 1 / 2, 25 August 1993 (1993-08-25), pages 197-210, XP000393378 ISSN: 0040-6090 paragraphs '02.1!, '02.2!, '2.34.1!, '04.2! -----	3,5-8
Y	STRITE S ET AL: "GAN, AIN, AND INN: A REVIEW" JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY: PART B, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 10, no. 4, 1 July 1992 (1992-07-01), pages 1237-1266, XP000296477 ISSN: 1071-1023 the whole document -----	9-13
Y	US 4 614 961 A (KHAN ET AL) 30 September 1986 (1986-09-30) the whole document ----- ----- -/--	9-13

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>SCHERER A ET AL: "InGaAsP photonic band gap crystal membrane microresonators &ast;"</p> <p>JOURNAL OF VACUUM SCIENCE & TECHNOLOGY B: MICROELECTRONICS PROCESSING AND PHENOMENA, AMERICAN VACUUM SOCIETY, NEW YORK, NY, US, vol. 16, no. 6, November 1998 (1998-11), pages 3906-3910, XP012007308</p> <p>ISSN: 0734-211X</p> <p>the whole document</p> <p>-----</p>	4,16-19
Y	<p>MONROY E ET AL: "AlGaIn-based UV photodetectors"</p> <p>JOURNAL OF CRYSTAL GROWTH, NORTH-HOLLAND PUBLISHING, AMSTERDAM, NL, vol. 230, no. 3-4, September 2001 (2001-09), pages 537-543, XP004296567</p> <p>ISSN: 0022-0248</p> <p>figure 1</p> <p>-----</p>	6,14,15
Y	<p>US 5 278 435 A (VAN HOVE ET AL)</p> <p>11 January 1994 (1994-01-11)</p> <p>column 2, line 59 - column 5, line 64</p> <p>-----</p>	6,10,14
P,Y	<p>DE VITTORIO M ET AL: "High temperature characterization of GaN-based photodetectors"</p> <p>SENSORS AND ACTUATORS A, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 113, no. 3, 16 August 2004 (2004-08-16), pages 329-333, XP004523091</p> <p>ISSN: 0924-4247</p> <p>the whole document</p> <p>-----</p>	9-12,14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB2004/004253

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4796590	A	10-01-1989	FR 2533316 A1	23-03-1984
			BR 8305167 A	02-05-1984
			CA 1242620 A1	04-10-1988
			DE 3381252 D1	05-04-1990
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			EP 0177918 A2	16-04-1986
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			JP 6014561 B	23-02-1994
			JP 61091977 A	10-05-1986
US 5278435	A	11-01-1994	AU 4599993 A	04-01-1994
			WO 9326049 A1	23-12-1993